Coastal Pelagic Species Workshop II:

Considerations for Rights-based Management in the Pacific Sardine Fishery

PROCEEDINGS

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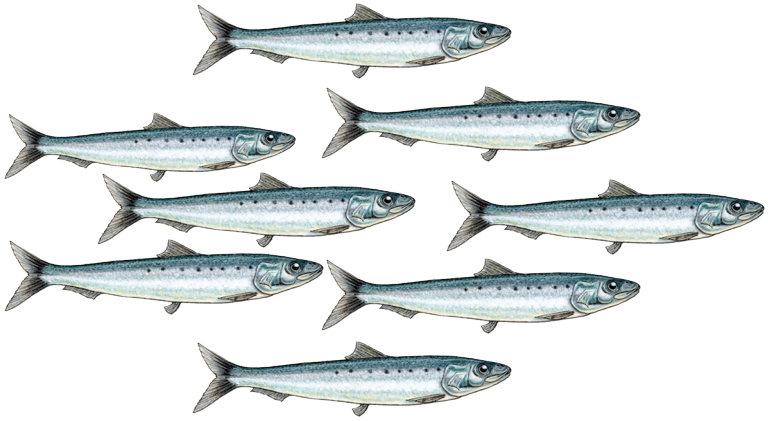

Coastal Pelagic Species Workshop II:

Considerations for Rights-based Management in the Pacific Sardine Fishery

April 24-25, 2012
Monterey, California

National Marine Fisheries Service

Preface

The National Marine Fisheries Service's (NMFS) Southwest Regional Office (SWRO) and Southwest Fisheries Science Center (SWFSC) convened a two-day workshop on April 24-25, 2012, in Monterey, California, to consider rights-based management (RBM) approaches in the context of whether they have the potential to enhance the social and economic sustainability of the U.S. West Coast Coastal Pelagic Species (CPS) fishery.
Key objectives were to:

- identify industry's key issues and objectives related to the future of the sardine fishery, both coastwide and regionally;
- explore how similar issues and objectives have been addressed through RBM approaches adopted elsewhere and consider lessons learned;
- review key elements of RBM programs and discuss industry's perspectives on existing and potential possibilities within each element; and
- identify follow-up steps needed to further consider rights-based management or other approaches.

The workshop included panel discussions and presentations featuring fisheries managers and stakeholders experienced with RBM approaches used for other fisheries in the United States. Discussions explored how RBM approaches have accommodated regional interests and flexibility, community considerations, and economic efficiency and net benefits.

Approximately 40 participants attended the workshop, including commercial fishermen, seafood processors, representatives of the Makah Nation and the Quinault Indian Nation, state and federal fishery managers, staff and members of the Pacific Fishery Management Council, and environmental organization representatives.

Mark Helvey, NMFS Assistant Regional Administrator for Sustainable Fisheries at the SWRO, opened the workshop by welcoming participants and highlighting the purpose of the workshop as an opportunity for stakeholders in the fishery to further explore ideas and interests around RBM approaches. He emphasized his hope to build upon the productive discussions during the February 2010 Coastal Pelagic Species Workshop and underscored that no decisions would be made during this workshop. Mr. Helvey cited several key developments in the fishery since 2010:

- The fishery continues to operate under pressures similar to a "derby" fishery with competition for harvest resulting in early season closures.
- The Quinault tribe was provided a set-aside quantity under its treaty rights.
- Several members of the fishery expressed interest in a catch share approach.

Sam Herrick, Industry Economist at the SWFSC, recalled the significant interest in communities and regional allocations at the 2010 workshop and suggested that participants revisit those discussions. In contrast to the 2010 workshop, the intent of this workshop was to examine a wider array of RBM tools and narrow the focus to U.S. experiences. Acknowledging different perspectives in the sardine fishery, Dr. Herrick encouraged participants to think beyond individual fishing quotas to evaluate an array of RBM tools for their potential to better serve the various needs in the fishery. He agreed with participants' assertions during the 2010 workshop that "one size does not fit all" and stressed the importance of an inclusive, "bottom up" approach to the design of any RBM program.

Following the opening remarks, Scott McCreary and Bennett Brooks, facilitators with CONCUR Inc., reviewed the agenda, proposed ground rules, and facilitated participation during the workshop.

Acknowledgments

A special thank-you is owed to the each of the participants of the workshop for taking the time out their busy schedules and traveling to Monterey, California, to share their knowledge, experiences, and perspectives. I believe our time spent discussing both the particular needs and interests of the Pacific sardine fishery and different rights-based management programs implemented in U.S. fisheries deepened our insights for the potential advantages and disadvantages of rights-based approaches for the Pacific sardine fishery.

I extend tremendous gratitude to the other Steering Committee members from NMFS for their help in planning and managing the workshop, including Sam Herrick, Kelly Denit, Jennifer Isé, Joshua Lindsay, Amber Rhodes, and Dale Sweetnam. In addition, I greatly appreciate the workshop planning assistance of Scott McCreary, Bennett Brooks, and Peter Bluhon of CONCUR, Inc., an environmental dispute resolution firm specializing in marine resource and water issues. I am especially grateful for Mr. McCreary's and Mr. Bluhon's facilitation of the workshop and for providing the Steering Committee with a key outcomes memo following the workshop. Lastly, special thanks to Amber Rhodes and Jennifer Isé for their efforts compiling and designing these proceedings.

Mark Helvey
Assistant Regional Administrator
Sustainable Fisheries Division
NMFS, Southwest Region

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Glossary of Acronyms

BSAI	Bering Sea and Aleutian Islands
CCA	central California
CDQ	Community Development Quota
CGOA	central Gulf of Alaska
CQ	cooperative quota
CQE	Community Quota Entity
CPS	coastal pelagic species
FMP	Fishery Management Plan
GT-ITQ	Grouper-Tilefish individual fishing quota
IFQs	individual fishing quotas
NMFS	National Marine Fisheries Service, or NOAA Fisheries
NOAA	National Oceanic and Atmospheric Administration
PNW	Pacific Northwest
RBM	rights-based management
RS-IFQ	red snapper individual fishing quota
SCA	southern California
SWFSC	NMFS Southwest Fisheries Science Center
SWRO	NMFS Southwest Regional Office

Photo: Portola Hotel in Monterey, California; location of the workshop.
Credit: Jennifer Isé.

INTRODUCTION

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS, or NOAA Fisheries), Southwest Regional Office (SWRO) and Southwest Fisheries Science Center (SWFSC), hosted a stakeholder workshop on April 24-25, 2012, in Monterey, California, to explore the potential for rights-based management (RBM) approaches to improve the management and operations of the U.S. west coast coastal pelagic species fishery. Forms of rights-based management, including limited entry, effort shares, and a wide variety of catch share programs, have been implemented in several U.S. fisheries to both improve management and enhance economic efficiencies. This was a follow-on workshop to one convened February 2-4, 2010, in San Francisco, California, which focused on RBM programs for coastal pelagic species fisheries implemented in other countries. The purpose of the 2012 workshop was to learn from the experiences of fishery managers and participants of domestic RBM programs when considering possibilities for RBM in the Pacific sardine fishery (see Appendix A for the agenda).

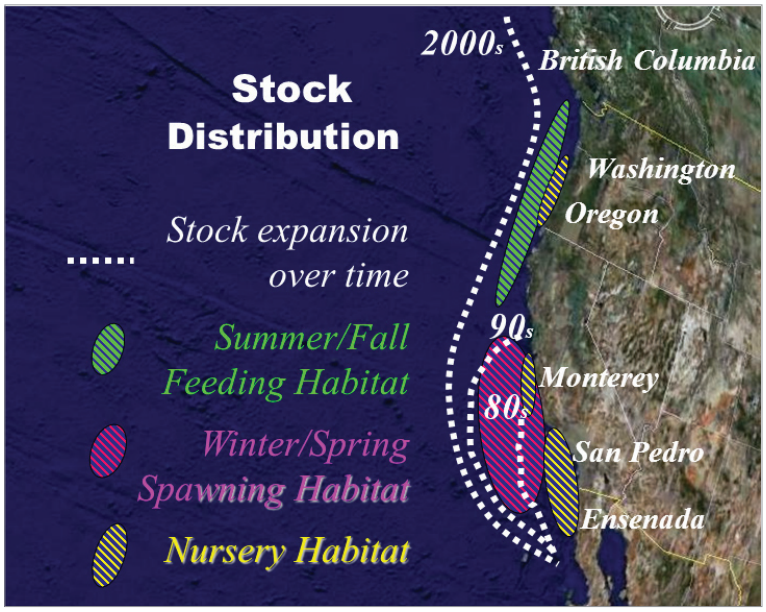
These proceedings summarize the principal themes presented and discussed by the speakers, panels, and participants at the 2012 workshop. It is not intended to serve as a complete record of all the ideas or views expressed. It does not represent consensus views of the attendees (see Appendix B for a workshop participant list).

Overview of the Pacific Sardine Fishery

Joshua Lindsay *is a fishery policy analyst in the Sustainable Fisheries Division at the NMFS Southwest Regional Office. He has been the lead policy analyst for the coastal pelagic fisheries (i.e., sardine, anchovy, and mackerel) off California, Oregon, and Washington since 2005. He also is involved in the examination and development of approaches toward ecosystem-based fisheries management and is a member of NOAA's West Coast Integrated Ecosystem Assessment team and the Pacific Fishery Management Council's Ecosystem Plan Development Team. He holds degrees from the University of California, Santa Barbara, and California State University, Northridge, where he studied marine and fish ecology.*

Pacific sardine is subject to conservation and management under the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP). Other species included in the FMP are northern anchovy, Pacific mackerel, jack mackerel, market squid, and krill (for which fishing is prohibited). Although the CPS fishery is a multi-species fishery, Pacific sardine is currently the primary finfish targeted by the U.S. west coast small purse seine/roundhaul fleet that makes up the harvesting segment of the CPS fishery.

The Pacific sardine fishery off the west coast of North America has been economically important since the early part of the 20th century. The Pacific sardine fishery developed in response to demand for food during World War I. Delivery of sardines to processing facilities (landings) increased from 1916 to 1936 and supported the largest fishery in the Western Hemisphere during the 1930s and 1940s. The fishery declined in the late 1940s and remained at extremely low/collapsed levels through the 1970s. In 1986, the State of California lifted an 18-year moratorium on sardine harvest on the basis of data indicating that the spawning biomass had returned to fishable levels. In January 2000, management authority for the U.S. Pacific sardine fishery was transferred to the Pacific Fishery Management Council when the CPS FMP was adopted. Around the same time that the FMP was being developed (the mid-1990s), the Pacific sardine stock expanded its range northward to the Pacific Northwest, prompting the start of state-managed fisheries off Oregon and Washington. A fishery for Pacific sardine has operated off Oregon and Washington since 1999.



Northern sub-stock of Pacific sardine expansion over time and it's current distribution and habitat use.

Today the U.S. fishery consists of fishermen and processors generally located among six ports in three main fishing areas: southern California (San Pedro/Terminal Island and Ventura), central California (Monterey and Moss Landing), and Pacific Northwest (Astoria, Oregon, and Westport, Washington). Fishing takes place near these ports, with essentially no fishing taking place between San Francisco and the Columbia River/Astoria, Oregon. The northern and southern areas of this fishery have different temporal characteristics. Historically, Pacific sardine landings in the southern area have occurred throughout the year, with most landings occurring in the winter months (December–March), whereas landings into Oregon and Washington have occurred throughout the summer and into early fall. However, due to

restrictive harvest limits over the past few years, landings in both regions have been grouped toward the start of each fishery allocation period (see below for allocation period details).

Under the CPS FMP, the CPS fishery is administratively divided into a "limited entry" fishery (i.e., requiring federal permits in order to participate) south of 39°N latitude (i.e., Pt. Arena, California), and an "open access fishery" (i.e., not requiring federal permits) north of 39°N latitude. However, the states of Oregon and Washington both have specific restrictions limiting the number of vessels in their respective fisheries. The CPS limited entry fleet currently consists of 65 permits and 58 vessels. In Oregon and Washington, fishermen must have individual state harvest permits to fish for Pacific sardine, with each state capping the number of permits at 25. In 2011, 30 vessels participated in the federal limited entry program, and 17 and seven vessels participated in the Oregon and Washington programs, respectively.

Main fishing areas and primary ports of the U.S. Pacific sardine industry.

The primary harvest target for the Pacific sardine fishery is based on the result of a harvest guideline (HG) formula specified in the FMP:

HARVEST GUIDELINE = (BIOMASS - CUTOFF) * FRACTION * DISTRIBUTION

- BIOMASS: The estimated stock biomass of Pacific sardine age one and above for the year.
- CUTOFF: The biomass level below which no commercial fishery is allowed. This level is defined as 150,000 mt in the FMP.
- DISTRIBUTION: The average portion of the Pacific sardine biomass estimated in the EEZ off the Pacific coast. The FMP as has set this at 87%.
- FRACTION: The harvest fraction is the percentage of the biomass above 150,000 mt that may be harvested. This value can vary between 5% and 15%.

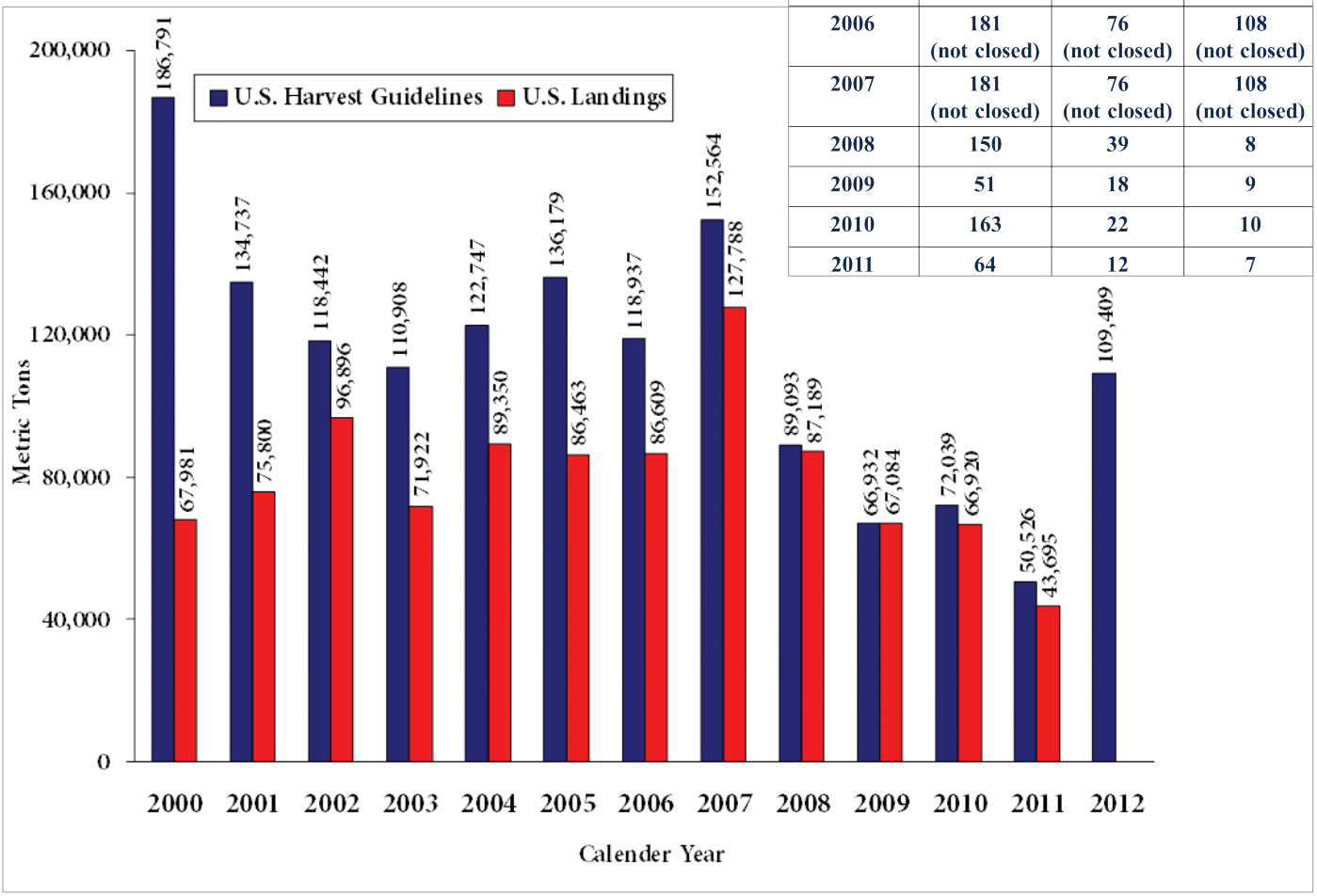
Example: 2012 HG = (988,385 mt - 150,000 mt) x 15% x 87% = 109,409 mt

The intent of the HG formula is to protect the sardine resource from overharvest while allowing for fishing opportunity. It is designed to continuously reduce the exploitation rate as biomass declines and to allow for increased harvest potential if environmental conditions are favorable to recruitment of the species and biomass increases. Annual quotas (e.g., annual catch limits, harvest guidelines, etc.) for Pacific sardine are based on formulas incorporating current/annual biomass estimates. The Pacific sardine season begins on January 1 and ends on December 31 of each year. In 2006, the adoption of Amendment 11 to the CPS FMP established the current allocation scheme for the Pacific sardine HG:

- On January 1, 35 percent of the HG is allocated coastwide.
- On July 1, 40 percent of the HG, plus any portion not harvested during the initial allocation period, is reallocated coastwide.
- On September 15, the remaining 25 percent, plus any portion not harvested during earlier allocation periods, is reallocated.

Because the different fishing areas operate on very different schedules, these seasonal allocations were intended to help ensure that everyone received a reasonable fishing opportunity. This purely temporal/seasonal allocation scheme was a departure from the previous two allocation schemes that also included a spatial component, with the quota also being divided between the northern and southern areas of the fishery.

Between 2000 and 2008 the total annual harvest allocation (i.e., harvest guideline) averaged 130,000 mt with average annual landings, accumulated across the three main areas of the fishery, of approximately 87,000 mt. But because of reduced biomass estimates the annual HG averaged 63,000 mt between 2008 and 2011, and the fishery reached fully utilization. These reduced HGs led to very early closures in all three allocation periods, particularly in the second and third periods when the fishery reached their allocation totals in only 10 to 20 days.



Year	1st period	2nd period	3rd period
2006	181 (not closed)	76 (not closed)	108 (not closed)
2007	181 (not closed)	76 (not closed)	108 (not closed)
2008	150	39	8
2009	51	18	9
2010	163	22	10
2011	64	12	7

The U.S. harvest guideline and landings of Pacific sardine for the years 2000-2012 (bottom) with the number of fishing days by allocation period for the years 2006-2011 (top right).

Summary of CPS Workshop I, February 2010

Mark Helvey is the Assistant Regional Administrator for Sustainable Fisheries with the NMFS Southwest Regional Office (SWRO). He received a M.S. degree in Marine Sciences from the University of Arizona and an M.B.A. from California State University, Long Beach. In his current position, he is involved in domestic and international fisheries issues as they relate to highly migratory and coastal pelagic species. Mr. Helvey represents the SWRO at the Pacific Fishery Management Council. His present interests revolve around seeking sustainable fishing opportunities for U.S. west coast fishermen.

Discussions about rights-based management during the 2010 workshop focused almost exclusively on catch share programs, which were not unanimously embraced by industry participants in the workshop. While many participants in the 2010 workshop acknowledged the potential for improved economic efficiency if the fishery transitioned to a rights-based or catch share management approach, many expressed concerns about community implications and whether such an approach would be flexible enough to account for regional differences within the fishery. These concerns served as the basis for this follow-on workshop in 2012, which explored a range of options available under a broader RBM approach.

Concerns raised about catch share programs during the 2010 workshop included:

- controversy over initial allocations, particularly around equity across the regions of the fishery;
- time requirements for design and implementation;
- the ability to adequately assess community impacts;
- the impacts to small landings operations and niche markets;
- deterrence to new entrants;
- access to adequate stock assessment information; and
- the effects of stock fluctuations on share values.

The 2010 workshop proceedings report is available at:
swr.nmfs.noaa.gov/fmd/cps/2010-cs-workshop-proceedings.htm

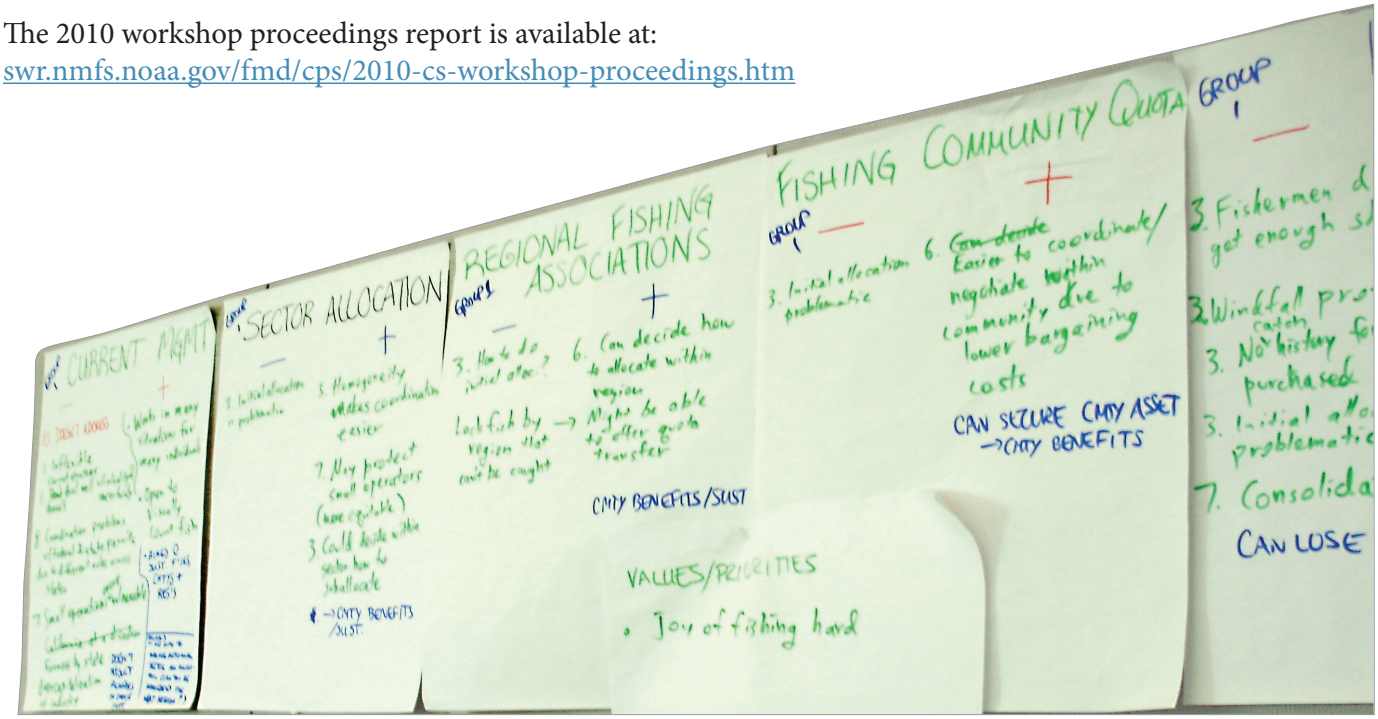


Photo: Notes from 2010 CPS workshop discussions about various rights-based management approaches . Credit: Mark Helvey

Credit: San Pedro fishing boats. Credit: Flickr user Blake Hadley.

RIGHTS-BASED MANAGEMENT AND CATCH SHARES IN THE UNITED STATES

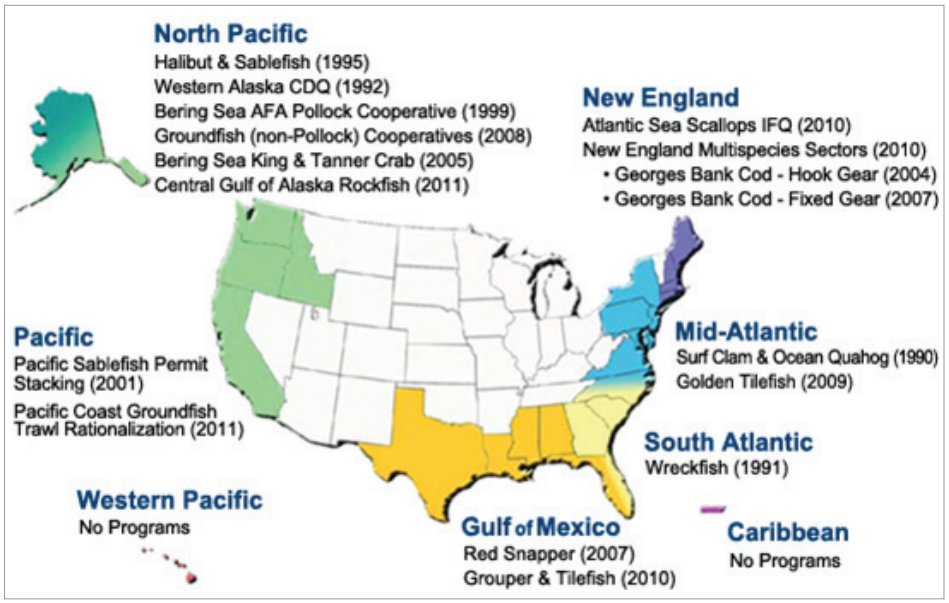
Fishery managers and industry representatives who participate in U.S. fisheries currently using RBM approaches shared their knowledge and perspectives with workshop participants. Fishery managers presented design and operational features of the catch share programs they help administer. Industry representatives discussed their perspectives about the effects of the programs on fishing operations and businesses (see Appendix C for the perspectives of individual panelists). These presentations and panel sessions were organized around three interest areas that emerged from the 2010 workshop: regional flexibility, community considerations, and economic efficiency. Summaries of the presentations for each interest area are provided first and the summaries of the three interest area panels follow at the end of this section.

The information exchange started with an overview of NOAA's Catch Share Policy and a panel session on U.S. industry experiences with catch share implementation. The NMFS Catch Share Policy Coordinator presented a comprehensive review of NOAA's guiding principles for catch shares, related requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and general lessons learned. After, industry representatives from several domestic fisheries that transitioned to RBM participated in a panel discussion.

Design and Use of Catch Shares under the Magnuson-Stevens Act

Kelly Denit *is a fishery management specialist in the NMFS Office of Sustainable Fisheries, Silver Spring, MD. The current focus of her responsibilities is to coordinate implementation of NOAA's catch share policy among NMFS regional and science center staff, NMFS headquarters staff, NMFS leadership, NOAA leadership, other federal agencies, Regional Fishery Management Councils, and NOAA's stakeholders. Kelly is responsible for evaluating and assessing current, short-range, and long-range policy and budget issues with respect to catch shares. Previously she served as a senior policy advisor on fisheries issues to the Under Secretary of Commerce for Oceans and Atmosphere (NOAA Administrator) and a policy advisor in the Office of International Affairs where she worked on various international fisheries topics such as the International Commission for the Conservation of Atlantic Tunas. She has a B.S. in Ecology from Yale University and an M.S. in Biological Oceanography from the University of Miami.*

"Catch shares" is a general term used for quota-based management strategies—which include Limited Access Privilege Programs (LAPPs) and individual fishing quotas—that dedicate a secure share of fish to individual fishermen, cooperatives, or fishing communities for their exclusive use. The first catch share program in the United States was implemented in 1990 in the Mid-Atlantic surf clam and ocean quahog fishery. Catch share programs are currently used in 15 fisheries managed by six Regional Fishery Management Councils, with additional programs in development.



U.S. catch share programs as of April 2012.

The MSA contains specific provisions for LAPPs in section 303A. These provisions lay out a series of requirements for LAPPs and cover a range of topics, from allocation to transferability, cost recovery, and community-related provisions. In addition to the MSA provisions, NOAA's Catch Share Policy, effective November 4, 2010, provides guidance and direction on catch share programs as a fishery management tool to build and maintain sustainable and prosperous U.S. fisheries and healthy ocean ecosystems. The policy was developed using input from each Council, commercial and recreational stakeholders, environmental groups, and thousands of public comments. NOAA's Catch Share Policy states, " to achieve long-term ecological and economic sustainability of the Nation's fishery resources and fishing communities, NOAA encourages the consideration and adoption of catch shares wherever appropriate in fishery management and ecosystem plans and amendments, and will support the design, implementation, and monitoring of catch share programs." No Council is required to adopt a catch share program. Additional information on catch share programs can be found at the following website: www.nmfs.noaa.gov/sfa/domes_fish/catchshare/index.htm.

U.S. Industry Perspectives on Catch Shares Panel Discussion

Panelists discussed the conditions in their respective fisheries prior to and after the implementation of a catch share program and shared their perspectives (see Appendix C for the individual perspectives of the panelists).

Questions to the Panel

- What key needs and interests in your fishery led to consideration of a RBM approach?
- What considerations were most important to you and others as the merits of shifting to a catch share program were weighed?
- What were the most significant concerns, and what were some of the strongest arguments in favor of moving to catch shares (i.e., pros and cons)?
- Reflecting on your experience with catch shares in your fishery, if you had to do it again, would you?

***Elizabeth "Libby" Etrie**, program director for the Northeast Sector Service Network, coordinates and facilities various operational and organizational needs to foster an efficient and economically viable sector management system for member Northeast groundfish sectors. Previously, she worked as a coordinator with the Gulf of Maine Research Institute, where she provided technical developmental assistance to participants in the New England multispecies groundfish fishery who were organizing sector options as the New England Fishery Management Council developed the new management policy.*

***Linda Kozak**, a lifelong Alaskan, grew up in Bristol Bay and fished commercially for salmon from a young age. She has resided in Kodiak for 35 years and began working as a fisheries consultant in 1987 for Kodiak hook-and-line fishermen fishing for halibut, sablefish, and Pacific cod. This expanded into working with Bering Sea/Aleutian Islands (BSAI) crab fishermen by the early 1990s. Currently, Ms. Kozak provides consulting services for several groups and individuals involved in the fixed gear fisheries of the Gulf of Alaska and the BSAI. Her harvester clients are involved in the halibut and sablefish individual fishing quota (IFQ) fishery, the BSAI Pacific cod freezer longline cooperatives, and the primary BSAI crab rationalization fisheries for golden king crab, Bristol Bay red king crab, and opilio and snow crab. She has worked on the development of several catch share programs and regularly attends the meetings of the North Pacific Fishery Management Council and Alaska Board of Fisheries, as well as other science and regulatory meetings.*

***Michele Longo Eder** is an attorney from Newport, Oregon. She is a graduate of Johns Hopkins University and Lewis and Clark Law School. She has served on the North Pacific Research Board and the U.S. Arctic Research Commission, and is currently a member of the Groundfish Allocation Committee of the Pacific Fishery Management Council. In 2012, she was appointed by the Secretary of Commerce to serve on the Marine Fisheries Advisory Committee. She is also the author of Salt in Our Blood: The Memoir of a Fisherman's Wife. She and her husband, commercial fisherman Bob Eder who has fished sablefish and dungeness crab with pots for more than 30 years, own the F/V Timmy Boy. Ms. Eder worked with commercial fishermen on the West Coast in support of the sablefish fixed gear limited entry program.*

***Bill Tucker** is a commercial reef fish fisherman in the Gulf of Mexico. He serves on several advisory panels to the Gulf Fishery Management Council, and is the Secretary of the Gulf of Mexico Shareholders Alliance, a fishing industry association. He helped design both the red snapper and the grouper and tilefish IFQs in the Gulf.*

Panel Discussion Points

- **Catch shares can afford greater operational flexibility in the business of fishing.**
  Alleviating concerns about time constraints on fishing opportunity allows for more flexibility in the ways one can conduct business. For example, rather than basing decisions to catch and sell fish on presumptions about when the total allowable catch for the fishery will be reached, individuals have greater flexibility to choose what fish to pursue and how to market their catch based on current conditions. This is particularly advantageous for multi-species harvesters and processors. One panelist reflected on their skepticism and personal introspection about moving to catch shares, "I had to take off my fishing boots and try to see things as objectively as possible—to ask, why didn't I like [catch shares] and to realize it was because of an in-grown belief that someone would get a larger share than the other." It became clear that "if I knew what my limits were, then I could relax."

- **Before designing a program, problems should be assessed and goals established.**
  Panelists agreed that engaging industry at the outset to create program goals and objectives is essential and that long-term values should be reflected. One panelist articulated that the strong ethic developed in competitive fisheries—"to go out and fish to the best of your ability"—is a vital principle to preserve in any catch share program. Another added, "you must create the program to make the fishery what you want it to be in 10 to 20 years." Contentious core issues that arise during program design will require thoughtful consideration, dialogue, and consensus to proceed. These issues include eligibility to participate (crew, communities, etc.); flexibility around gear types; initial allocations; leasing and transfer guidelines; and ownership caps. As one panelist put it, "How do you allocate the quota? There are a million ways, but the answer is that you do what addresses your objectives."

- **It takes time and knowledge to develop a catch share program.**
  Panelists noted that the process of developing the programs is time-consuming, and described situations where time constraints affected decision-making. Information exchange and engagement with industry were identified as critical to program design, with lack of participation having negative implications once the program was implemented. One panelist expressed, "There are thousands of lessons to be learned with [our program], but mainly we just wish we knew then what we know now."

- **Over-capitalization and/or the lack of stability in fisheries were key drivers in adopting catch share programs.**
  These drivers were generally consistent across the four fisheries represented. Common to all was a derby-style fishery with too much effort and short fishing seasons. This led to "too many boats pursuing too few fish," as one panelist articulated. Market gluts, inconsistent product availability, and depressed fish prices resulted. This in turn led to uncertainty, instability within the fleet, and crews who were inefficient and less than professional with only short-term seasonal employment opportunities available to them.

- **Catch shares change the nature of entering a fishery, but they do not preclude new entrants.**
  When designed appropriately, a catch share program will provide flexibility and address new entrant opportunities through purchase, leasing, and transfer of quota. One panelist explained, "Catch shares gave us the ability to control effort in an overcapitalized fishery in a way that didn't eject people, but rather allowed people who value cash more than fish to voluntarily choose that." Another panelist described how a catch share permit might be cost-prohibitive for a 25-year-old, but that new entrants have the ability to lease quota to build up capital. Another panelist suggested that the market is capable of keeping quota purchase prices within reach, i.e., the market adjusts when asking prices are higher than buyers' willingness or ability to pay.

- **A full-time, more professional fleet and a fair market for allocations resulted.**
  One panelist underscored the benefits of catch shares for the fleet. As more fishermen were able to fish full-time under the program, the fishery went from "being an avocation to being a business and career; catch shares professionalized the fleet." In several fisheries, fishermen were able to catch fewer fish (i.e., less effort needed) yet make the same or more money as prices rose and stabilized. Overcapacity dropped as a result of allocation purchases and transfers when participants cashed out of the fishery. The programs created markets for permits, so that participants who wanted to build their fleet could finance and purchase permits.

Top left photo: Makah nation and Waatch river. Credit: Flickr user Sam Bebee. Top right photo: Monterey Bay marina. Credit: Josh Lindsay. Bottom right photo: California coast. Credit: Flickr user Jason Pratt. Bottom left photo: Fishing boats in San Pedro. Credit: Flickr user Blake Hadley.

Regional Interests and Flexibility

During the 2010 workshop, participants discussed various elements of catch share programs. The group had concerns with individual fishing quotas (IFQs or ITQs) and had mixed views on permit stacking and sector and community allocation methods. However, they viewed regional allocations more favorably as a potential means to recognize social and cultural differences among the primary regions in which the Pacific sardine fishery is executed (i.e., southern California, central California, and the Pacific Northwest, with a potential split between Oregon and Washington fisheries).

Speakers and panelists in this session discussed their experiences building flexibility into their programs to accommodate diverse interests. The two presenters covered the Northeast Groundfish Sector Program and the Alaska Rockfish Program, both of which included provisions for choice models and pooled quotas. In both programs, participants were able to choose whether to join a quota sharing group (i.e., sector or co-op) or remain in a limited entry program and continue to competitively fish under a common pool quota. While this choice model provided flexibility for individual fishery participants who wished not to participate in the catch share program, it required additional administrative resources to operate a dual management system. In addition, pooling the catch shares into quota holding groups provided flexibility to communities and fishing groups to address their unique needs and interests through co-management opportunities, such as sustainability plans. Following the regional flexibility session presentations, panelists shared their lessons learned and gave advice for considering flexibility when designing rights-based management programs.

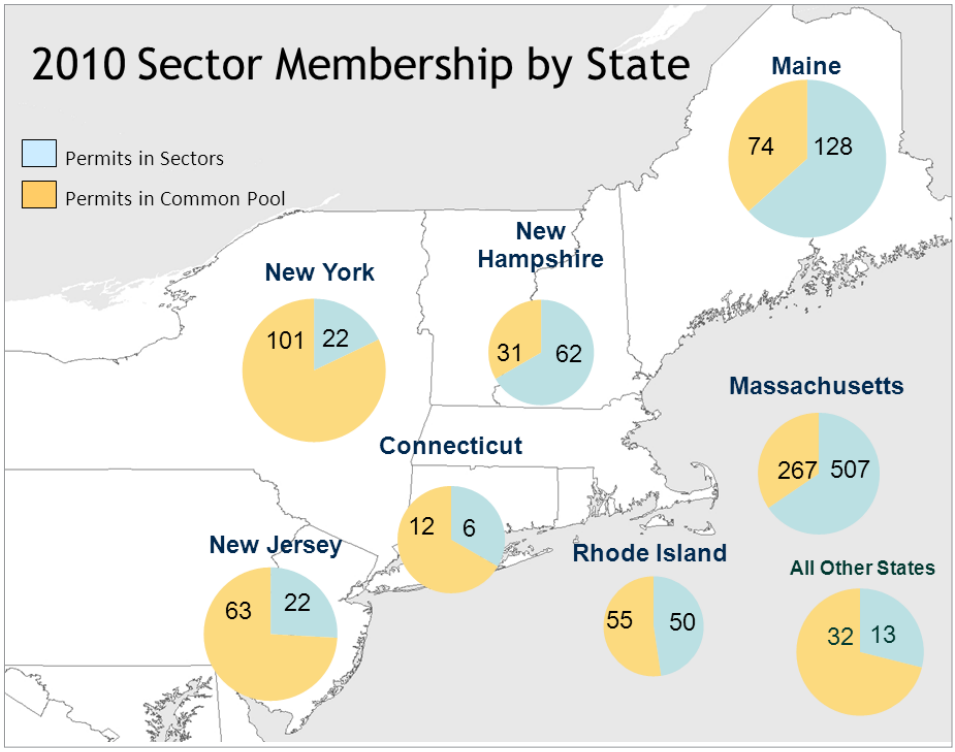
Northeast Groundfish Sectors

__Mark Grant__ is a sector policy analyst at the NMFS Northeast Regional Office in Gloucester, Massachusetts. He began working on Northeast multispecies (groundfish) sectors in 2006 when there were two small sectors allocated a single stock. From 2008 to 2010, Mark led the implementation effort for the expansion of groundfish sectors that became effective May 1, 2010. This two-year process involved direct collaboration with groundfish industry members, industry groups, and other support organizations to cooperatively map out how to practically implement the shift from a system of input controls (trip limits and days-at-sea) to a more flexible system based on allocating quotas to voluntary groups of fishermen in exchange for responsibility on the part of the fishermen. Since 2010 Mark has continued to collaborate with industry on problem-solving and improvements to the operation of the sector system.

This overview of sectors focuses on the transition of the groundfish fishery to a catch share management system and does not reflect impacts to individual vessels or detail differences between vessel sizes, gear types, or regions. However, it is important to think about the differences within a fishery and incorporate those into the development of the fishery management plan and the implementation of that plan. There is an old hippie saying, "Get involved. The world is ruled by the people who show up." If a catch share program is being considered, make sure that everyone is involved from the start. Knowledge is power. Make sure stakeholders are empowered with information. At every stage of development and implementation information is needed. Start to think about, gather, and analyze data early in the process so that it shapes decisions.

The Northeast groundfish fishery ranges from the Canadian border south to North Carolina and east to Georges Bank and the 200 mile EEZ line. Fishing activity is primarily concentrated in the Gulf of Maine and on Georges Bank, while ports in New England see the bulk of groundfish landings. The Northeast Multispecies Fishery Management Plan includes 13 species, managed as 20 stocks. These are all bottom-dwelling species and are harvested using bottom trawls, sink gillnets, and benthic longlines.

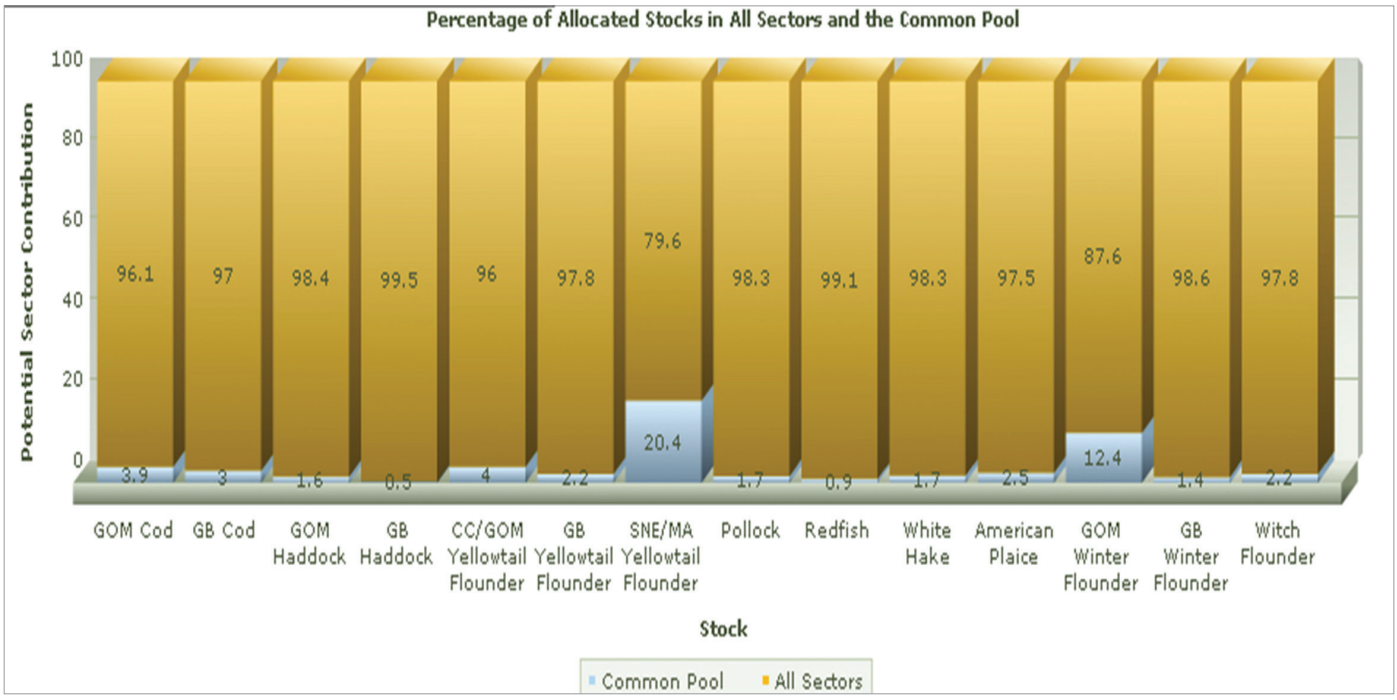
Vessel sizes range from skiffs up to about 110 feet in length. Generally, the groundfish fleet can be divided into day boats and offshore trip vessels, but all vessels are legally permitted to fish all open areas. The day boat fleet is generally owner-operator, but many may own one or more additional vessels. The offshore fleet includes owner-operators, but also has larger entities owning multiple active vessels.



Northeast groundfish fishery permits separated by participation in the sector program or common pool.

Sectors are different from most catch share programs. First and foremost, the New England Fishery Management Council did not decide to manage the entire fishery through catch shares. The pre-existing management system (i.e., use of input controls such as trip limits and days-at-sea controls) was retained with vessels having the choice each year to fish either under the input control system or as part of the sector catch share system. The goal of expanding the sector catch share was to provide vessels with options to mitigate the economic impacts of reductions in allowable catches. A key fact to note is that this sector system became effective at the same time as the requirements for annual catch limits and accountability measures under the reauthorized MSA. In the Northeast, this was compounded by a new stock assessment requiring harvest reductions for some key stocks. Sectors provide a mechanism for capacity reduction, and provide incentives to self-govern, by allowing vessels to pool harvesting resources and consolidate operations in fewer vessels. This is not an individual fishing quota program because allocations are made to the sectors annually and not to individual vessels. Only vessels with a limited access multispecies permit are eligible to join a multispecies sector.

Sectors succeeded in achieving the goal of mitigating the impact of quota cuts. Nearly all active vessels, and many inactive permits, elected to join sectors. However, that still is only about half of the eligible permits because many vessels that initially qualified for a groundfish permit were not truly active groundfish vessels. The result has been that more than 98 percent of groundfish is allocated to sectors. In the first year of sectors, the number of groundfish trips and the amount of time spent fishing for groundfish declined substantially, while the number of non-groundfish trips and the amount of time spent fishing for non-groundfish species stayed nearly constant. Catch of groundfish only declined 18 percent while catch of non-groundfish declined about six percent. While catches were down, there was an increase in the efficiency of catching groundfish. Revenues for groundfish declined very little (i.e., in comparison to quota cuts) while revenues for non-groundfish increased. This does not account for changes in costs—to set up sectors, to operate sectors, and for monitoring (i.e., currently paid by the government)—and the social impact of a change from independent to cooperative work.

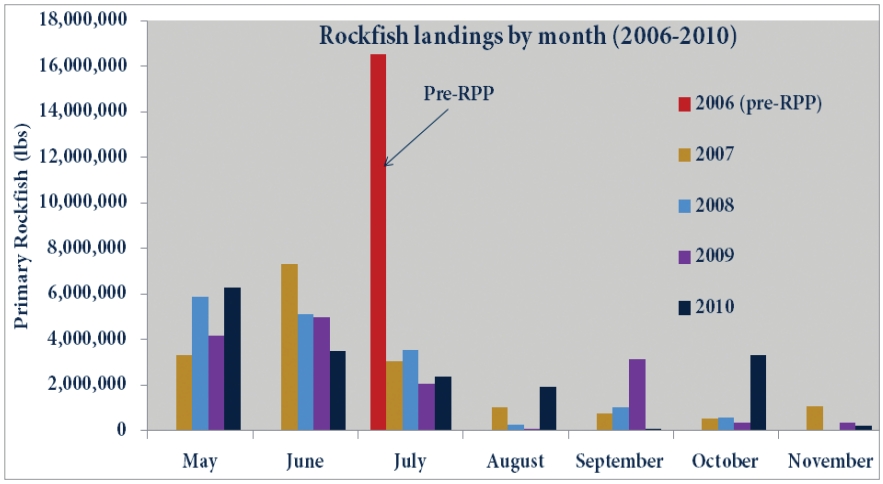


Percentage of Northeast groundfish fishery stocks allocated to the sector program versus the common pool.

Alaska's Rockfish Program

Rachel Baker is a supervisory fishery management specialist for the National Marine Fisheries Service NMFS Alaska Regional Office. She develops and implements fishery management regulations for federally managed fisheries off Alaska, including groundfish, crab, and Pacific halibut fisheries, in accordance with federal and state laws. Rachel currently supervises the Catch Share and Allocation Branch for the Sustainable Fisheries Division in the Alaska Region, which focuses on fishery management plans and regulatory amendments for Alaska's catch share programs. Rachel has been with the Alaska Region since 2008 and has worked primarily with the halibut and Bering Sea/Aleutian Islands crab and groundfish fisheries. Previously, Rachel was a fisheries analyst with the New Zealand Ministry of Fisheries and an economist with the Alaska Department of Fish and Game.

Fishing under the Central Gulf of Alaska (CGOA) Rockfish Pilot Program (Pilot Program) began in May 2007. The Pilot Program was a multi-species trawl catch share program in Kodiak, Alaska, for approximately 62 catcher vessels and catcher/processors. The Pilot Program expired five years later in December 2011, and was recently replaced in 2012 by the CGOA Rockfish Program. The Pilot Program was implemented to provide economic stability for Kodiak, which was challenged by a race for fish and conflicts with other fisheries.



Central Gulf of Alaska Rockfish landings (in lbs) by month, 2006-2010.

Catcher vessels and catcher/processors qualified for exclusive harvesting and processing privileges based on their history in CGOA rockfish fisheries during the qualifying years 1996–2002. Participants were required to form cooperatives to receive cooperative quota (CQ), which was harvested by the cooperative members each year. Catcher vessel cooperatives were required to form an association with a shoreside processor to which their members had historically delivered CGOA rockfish. Participants also had the option to join a separate limited access (i.e., non-catch share) fishery on an annual basis instead of forming a cooperative, but were required to compete for their catch. Sideboards limited the ability of rockfish harvesters to expand into other fisheries beyond historical participation levels during July.

An eligible rockfish catcher/processor had the option to opt out of many of the Pilot Program requirements. Additionally, with five percent of the rockfish program species catch limits, an entry level fishery was established to provide harvesting and processing opportunities for catcher vessels and shoreside processors who had not traditionally participated in the CGOA rockfish fisheries. The Pilot Program allowed transfers of quota share between eligible recipients and transfers of CQ between cooperatives. Four different types of use caps were designed to limit the degree of consolidation that could occur. Monitoring and enforcement provisions included observer coverage on vessels, a catch monitoring and control plan for shoreside processors, and observer monitoring of deliveries.

The limited duration of the Pilot Program allowed for thorough program review and for the implementation of a new CGOA Rockfish Program in 2012. The CGOA Rockfish Program is similar to the Pilot Program in implementation, management, monitoring, and enforcement measures. However, some changes were made based on the review by the North Pacific Fishery Management Council. These changes included the cessation of the non-catch share limited access fishery, the restriction of the entry level fishery to non-trawl gear, the removal of the requirement for catcher vessels to deliver to a specific processor, and the implementation of a cost recovery program for all participants.

Small right photo: San Pedro, California fish dock. Credit: Flickr user Magic Madzik. Middle photo: Historic fish cannery in Astoria, Oregon. Photo: Flickr user Ben Tilden. Small left photo: Historic canneries in Monterey, California. Credit: Flickr user jimg944.

Community Considerations

Participants at the 2010 workshop expressed concerns about how RBM programs, such as catch shares, could affect their communities. In general, participants were uncertain about the capacity and responsibility for assessing community impacts. Of particular concern was the potential for concentration of market power, deterrence of new entrants, and impacts to small landings operations and niche markets.

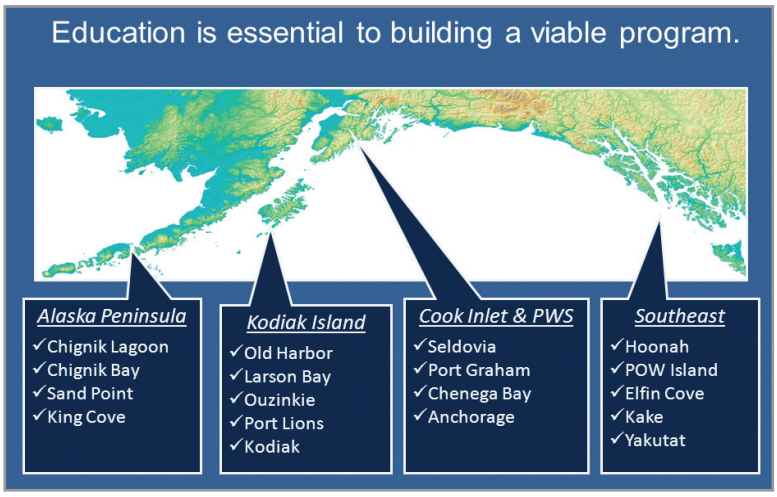
In this session, the speakers and panelists discussed potential community implications with RBM, program design considerations, and resources for community capacity-building. In Alaska, both Community Development Quotas (CDQs) and Community Quota Entities (CQEs) were created to improve social and economic conditions for communities and to build their capacity to engage in commercial fishing. However, the differences in the initial allocation specifications are possible reasons for the substantial differences in the outcomes of the two programs. Ecotrust, a non-governmental organization, has been exploring some of the dynamics of these catch share programs and others for their impacts to communities. Ed Backus of Ecotrust shared some of his organization's findings and community resources in development. Together, the panelists identified some key distributional challenges and provided recommendations for more fully integrating community considerations into the design, implementation, and evaluation of catch share programs in the future.

Western Alaska Community Development Quotas and Halibut Community Quota Entities

Rachel Baker, *NMFS, Alaska Regional Office. See page 13 for her professional biography.*

In Alaska, two models have been developed to provide fisheries-related economic development opportunities for coastal communities. The first model, the Community Development Quota (CDQ) program, allocates an exclusive portion of the Bering Sea and Aleutian Island fisheries resources to eligible participants. The CDQ program includes 65 eligible communities within a 50-mile radius of the Bering Sea coastline. The communities formed six regional organizations, referred to as CDQ groups. The purpose of the CDQ Program is to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries and to achieve sustainable and diversified local economies.

Since 1992, the CDQ program has generated over $110 million in wages, education, and training benefits for community residents. Revenues generated from receiving exclusive allocations of fishery resources have allowed CDQ groups to acquire ownership interests in harvesting and processing resources and to invest in other infrastructure improvements to facilitate CDQ participation in fisheries managed by catch share and limited access (i.e., non-catch-share) programs. These CDQ ownership interests provide additional revenues to fund local in-region economic development projects, and education and training programs. The CDQ program is generally viewed as a successful rural development program for western Alaska.



NMFS joined a community stakeholder organization and other agency partners to visit 18 coastal communities in 2004 and 2005 to hold workshops on the Community Development Quota Program.

Under the second community fisheries model developed in the Gulf of Alaska, 42 eligible communities may form non-profit organizations called Community Quota Entities (CQEs). These CQEs may purchase fishing quota issued in the halibut and sablefish catch share program and lease the annual harvesting privileges to community residents. Unlike the CDQ program, CQEs are not allocated fishing quota; they must purchase the quota. No start-up funding was provided for CQEs to purchase fishing quota. The intent of the CQE program is to provide additional opportunity to fishermen in communities where fisheries participation by residents substantially declined following implementation of the halibut and sablefish catch share program in 1995. After the CQE program was implemented in 2004, it was expanded to authorize some eligible CQE communities to receive no-cost limited access permits for participation in non-catch-share commercial and guided sport (charter) halibut fisheries.

More than five years after implementation, the CQE program has not reached its potential for increasing community resident participation in the halibut and sablefish catch share fisheries. Roughly 29 of 42 eligible communities completed the process to form a CQE, but only two CQEs have purchased fishing quota. Financial barriers to purchasing fishing quota and program-related restrictions have been cited as possible reasons for the lack of participation among eligible communities.

Effects on Communities of Catch Shares (i.e., IFQs): Patterns and Adaptation

Edward Backus *is the vice president of Fisheries at Ecotrust. He oversees the Community Fisheries Program, which includes marine and salmon initiatives from Alaska to California. He is founder and chair of the North Pacific Fisheries Trust, a community fisheries quota revolving loan fund, an Ecotrust subsidiary. Ed is co-organizer of the Community Fisheries Network, an emerging national peer group of locally based fisheries organizations working on stewardship innovation. He is past-chair of the board at the Prince William Sound Science Center (Alaska), a board member of the Alaska Sustainable Fisheries Trust, and a conservation committee member of the Sea Change Investment Fund. He was born and raised in Woods Hole, Massachusetts, and fished commercially out of Nantucket in the early 1980s.*

Often in the outcomes of catch share programs, there are changes in patterns of a fishery that we do not want (e.g. social and cultural changes). But another way to frame these issues is to put them in terms of how we design catch share programs to maintain community stability and promote intergenerational equity. The question is, "Can we design changes to better address the full suite of patterns—ecological, economic, and social?" A problem statement (i.e., list) that addresses social and economic issues in catch shares includes a range of serious effects, including migration of quota shares from communities in market transactions, high debt loads that create barriers for replacement (i.e., new) entrants, and leasing practices that accrue gross revenues to non-fishing owners by eroding them from fishermen. The community provisions in the national fisheries law (i.e., MSA §303A) are possible tools to address these issues.

Issues

Increased value to fisheries from catch shares can bolster fishing opportunities or threaten them. Transition from fish in the boat to a quota share on paper creates an "asset" that can be regarded as an economic development asset and used to strong local advantage. However, it also can be tempting to leverage, lease, speculate, and otherwise focus on the quota share as an instrument of trade and business instead of the business of fishing. Asset prices generally increase and this creates opportunities for initial issues and barriers for new entrants.

Perpetual leasing (e.g., British Columbia) may lead to "sharecropping." Leasing by initial recipients at relatively high rates (e.g., 45 to 55 percent or higher) by retired, initial issuee owners of quota shares generates large amounts of cash. But this makes lessors start with far less in gross revenues, "off the top," at the dock. Cash buys even more quota for those owners, of which very few are capped in holdings by the management program (e.g., share caps in the Alaska halibut fishery), suggesting that more consolidation may happen. These buyers are willing to pay higher prices as the cost basis of total quota share holdings is zero (or very low), leaving new fishermen little ability to hold privileges as assets into the future.

Debt loads can severely restrict the ability of the next generation to participate in the fishery. As an example, 25,000 lbs of halibut quota share at $30/lb. equals $750,000. If a new entrant could acquire a NMFS loan at 30 percent down, the cash upfront required would be $225,000. The remaining debt would be $525,000. At six percent interest for 30 years, payments would total $1.14 million, including principal and interest (e.g., interest of $619,000, $38,000 annual payment.) This is the basic barrier for replacement (i.e., new) entrant fishermen—where do you get the down payment or collateral?

Tools

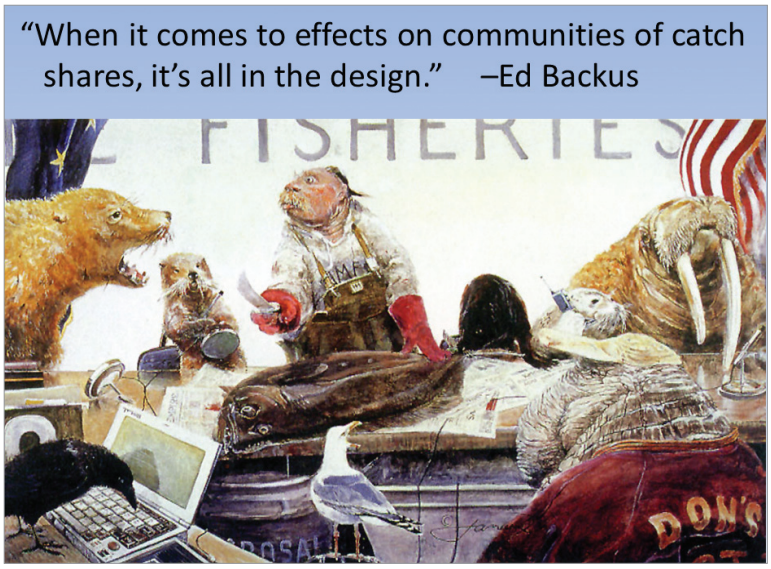
Community entities are allowed under MSA as regional fishing associations or fishing communities, but Regional Fishery Management Councils are required to establish criteria. There is a precedent in Alaska as CDQ and CQE.

They function like a land trust—hold assets in the public interest, keeping quota in communities for residents, leasing at low rates (e.g., overhead eight to 12 percent). Holdings are a capped portion of potential quota and can be used to help create risk and insurance pools.

Working in the context of community fisheries organizations creates new forms of governance and new capacities at the community level—within fleets, thus sharing the management burden with agencies, an example of real co-management (e.g., New England sectors are one such case). Many participants feel the tension between individual and collaborative approaches—but one supports the other. The Community Fisheries Network has developed a beginning set of standards with the goal of assisting communities and businesses to use and connect these practices to marketplace brands and Community Sustainability Plans (www.communityfisheriesnetwork.org/archives/SustainabilityStandardsOutline.pdf). There are many types of community entities now in existence: permit banks, community fishing associations, community quota banks, community quota entities, sectors, fishing cooperatives, fisheries marketing associations, and community development quota corporations. (For more information and resources developed by Ecotrust on community dimensions and catch share program and market designs, visit: www.ecotrust.org/fisheries and www.ecotrust.ca.)

Standards and Metrics

What should the standards be for sustainable community-based fisheries entities and operations? Many take the "triple bottom line" approach—social, economic, ecological. The Community Fisheries Network has developed a beginning set of standards with the goal of assisting communities and businesses to use and connect these practices to marketplace brands and Community Sustainability Plans. Community Sustainability Plans and Regional Fishing Association Plans are requirements in MSA §303A as part of the community provisions … if exercised by Regional Fishery Management Councils. The Community Fisheries Network has drafted an example plan using a community-based hook-and-line fleet in Oregon. New England sector operations plans are a possible proxy for the development of these plans.



An artist's rendition of fishery management that Ed Backus selected to portray his quote.

Lessons Learned

Catch share design solution lessons:

- Grandfather some of the catch history (i.e., that of active vessels).
- Allocate some to community "trusts." CDQs in Alaska were allocated quota. They are thriving multi-million-dollar economic development community engines. CQEs are the opposite—they have to buy quota and they are not making it because they have to take on too much debt.
- No leasing by retirees (i.e., initial issuees).
- Allocate some for fixed term—15 years.
- Only allow community-based perpetual ownerships.
- Require performance indicators are reviewed for retaining quota in a fixed-term cycle.

These solutions to catch share designs help ensure social, economic, and ecological accountability as well as foster both business and community.

Top left photo: Sardine fishing at night. Credit: California Department of Fish and Game. Top right photo: Canned seafood products. Credit: Flickr user angsthase. Bottom left photo: Sardine sorting. Credit: California Department of Fish and Game. Bottom right photo: Sardine in a basket. Credit: © Fotosearch.com.

Economic Efficiencies and Benefits

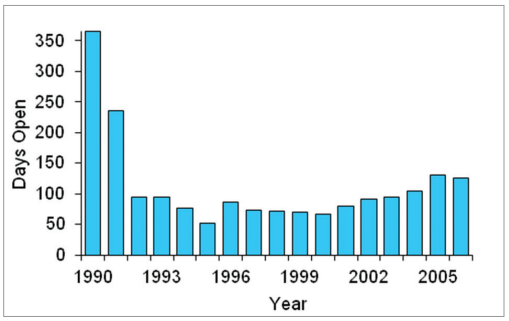
The potential to improve economic efficiency and market stability in the Pacific sardine fishery was viewed by some participants at the 2010 workshop as possible reasons to consider transitioning to a stronger form of RBM. More specifically, their interests were in stabilizing the market by enhancing the timing of harvests and the continuity of supply. They thought that, by improving these conditions, they could devote more time to business planning and generate more value in the fishery. However, there was no consensus among participants about the urgency in addressing these needs and whether the outcomes of a catch share program would be worth what participants perceive as requiring a large amount of planning time and additional regulatory complexity.

The speakers and panelists in this session discussed the catch share programs in the Gulf of Mexico red snapper and Pacific sablefish fisheries, focusing on the economic conditions pre- and post-implementation. Both catch share programs were constructed with relatively simple permit features. In this sense, these programs required fewer administrative complexities and sideboard regulations compared to some of the other programs discussed in previous sessions.

Gulf of Mexico IFQ Programs: Red Snapper and Grouper-Tilefish

Jessica Stephen *is a fisheries biologist at the NMFS Southeast Regional Office and works in the Limited Access Privilege Program branch. Previously, Jessica gained over 10 years of experience in offshore fishery-independent research with the state of South Carolina and the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program. She has extensive knowledge of fishery populations, life-history analysis, stock assessments analysis, and fisheries management. She recently completed her Ph.D. in Marine Science at the University of South Carolina, where she explored the effects of minimum size regulations on exploited fish populations.*

The Gulf of Mexico has two IFQ programs: the single-share category Red Snapper IFQ (RS-IFQ) program that began in 2007 and the multi-species multi-share category Grouper-Tilefish IFQ (GT-IFQ) program that began in 2010. For both IFQ programs, the fishery is composed of small boats (i.e., 10 to 73 feet) manned by small crews fishing with hook-and-line gears, such as handlines, bandit reels, and longlines. The IFQ programs were developed to address over-capitalization, quota overages, and short fishing seasons resulting in a derby-style fishery with decreased safety-at-sea, market gluts, high operating costs, and high bycatch and discard mortality. The main goals of the IFQ programs were to reduce overcapacity and mitigate derby fishing conditions, which would lead to improved safety-at-sea, increased market stability, increased fishing flexibility, and cost-effective and enforceable management.



Number of days per year that the Gulf of Mexico red snapper fishery was open from 1990 through 2005.

Both IFQ programs are managed completely through an online data collection system, where users are assigned accounts and all transactions are completed electronically. The online system allows for real-time data updates, automatically links to the NMFS permitting system, and does not limit users to traditional working hours. Both programs were limited to users with valid reef fish permits for the first five years of the program, after which any U.S. citizen or permanent resident alien could obtain an IFQ account. During the first five years, only accounts that maintained their reef fish permit could receive shares or allocation and harvest fish. Accounts that did not maintain their permit were limited to only selling allocation or shares.

Commercial Quotas/Catch Allowances for 2012 in gutted pounds

Share Category	Share Cap %	Quota/Catch Allowance	2012 Landings	% Quota Landed	Quota Remaining
DEEP WATER GROUPER	14.704321	1,127,000	128,194	11.3	998,806
GAG GROUPER	2.349938	567,000	177,330	31.2	389,670
OTHER SHALLOW WATER	7.266147	509,000	69,222	13.5	439,778
RED GROUPER	4.331882	5,370,000	1,473,752	27.4	3,896,248
RED SNAPPER	6.020300	3,300,901	951,708	28.8	2,349,193
TILEFISH	12.212356	582,000	70,800	12.1	511,200

IFQ Customer Support Toll-Free 866-425-7627

IFQ Customer Support Email SER-IFQ.Support@noaa.gov

Example manager interface of NMFS Gulf Reef Fish Program individual fishing quota online system.

The two programs were designed with many similar quota share distribution and ownership provisions. Initial share distribution differed slightly in both programs, but in essence was based on historical catch records within a given time frame and current ownership of a reef fish permit. Quota share caps exist in each program, with the GT-IFQ program also having an allocation cap (maximum amount of pounds held by a single entity). Fishing flexibility measures were built into each IFQ program, including a 10 percent overage allowance, multi-species share categories, and multi-use allocation that can be used between share categories.

After five years, the RS-IFQ program has seen a 25 percent consolidation in shareholders. Fishermen have taken advantage of the increased flexibility by landing red snapper year-round, which also mitigated market gluts that resulted from short seasons. Furthermore, with the implementation of the GT-IFQ program, fishermen from both fisheries bought allocation or shares from the other IFQ program, allowing them to harvest bycatch fish that otherwise might have been discarded. Bycatch has decreased over time in some geographic areas, but further work is needed to reduce bycatch of red snapper off the west Florida shelf as the stock rebuilds. Many of our share categories have seen increases in quotas; within red snapper over 95 percent of the quota is landed each year.

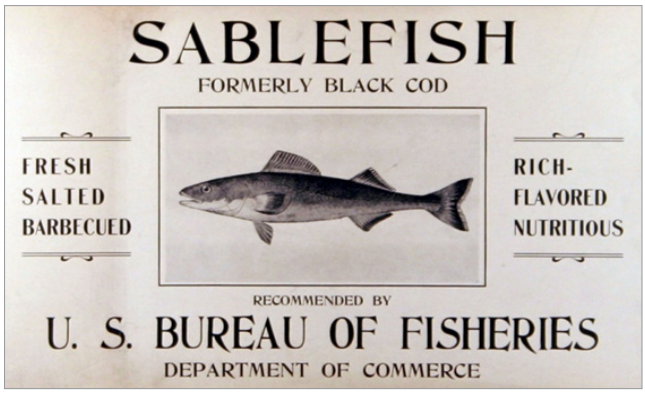
Management and law enforcement have improved, especially as a result of the real-time data supplied by the online system and vessel monitoring systems. In particular, we have seen a decrease in the number of seizures each year. Determining the economic and social benefits from the program has been difficult, primarily due to difficulty getting accurate price information for allocation and share transactions, as well as ex-vessel values. While we have seen increases in all of these price categories, these data are often misreported or not reported, which leads to greater uncertainty when analyzing the data. Our next efforts are concentrating on the five-year review of the Red Snapper IFQ program and the addition of more reef fish species to the program.

Catch accounting requirements for the Red Snapper and Grouper-Tilefish IFQ Programs.

West Coast Groundfish Sablefish Permit Stacking Program

Jamie Goen works with the NMFS Northwest Regional Office as a federal fisheries manager for the groundfish fishery off the west coast. She has worked for NMFS for over 10 years and has been involved with implementation of several individual fishing quota (IFQ) programs on both coasts, including the West Coast Groundfish Sablefish Permit Stacking Program, the West Coast Groundfish Trawl Rationalization Program, and the New England Scallop IFQ Program. Jamie enjoys collaborating with the fishing industry to maintain sustainable fisheries and values the use of fishermen's knowledge in the management of those fisheries. She holds degrees from the University of Washington and the University of Miami.

The West Coast Groundfish Sablefish Permit Stacking Program is a type of individual fishing quota (IFQ) where up to three limited entry permits, each with an associated amount of sablefish for harvest, may be registered to a single vessel. The program was implemented in stages by the Pacific Fishery Management Council (Pacific Council) and NMFS to address overcapacity and short fishing seasons.



U.S. Government published poster, circa 1917.

In 1997, NMFS implemented the Pacific Council's first step—a sablefish endorsement program for limited entry permit owners. This was intended to reduce overcapacity by restricting participation to those permit owners with historical participation in and dependence upon the sablefish fishery. Today, 164 limited entry permits have sablefish endorsements. In 1998, NMFS implemented the Pacific Council's next step—to manage the season with a three-tiered cumulative limit regime. NMFS assigned a tier designation of one, two, or three to each sablefish-endorsed permit based on historical landings associated with a specific limited entry permit. During the primary season, a participant could land an amount of sablefish up to the cumulative limit associated with their permit's tier. The three-tier system slowed the rate of capitalization in the fishery. Vessel owners no longer had an incentive to increase their fishing speed because they were limited in how much sablefish they could catch by their permit's tier.

In 2001, the program was implemented and allowed a vessel owner to register up to three sablefish-endorsed permits for use with their vessel and to harvest the cumulative limits associated with each of those permits (i.e., stacking permits). A sablefish-endorsed permit is transferable but the endorsement and tier are permanently affixed to the permit. The program also extended the season length from about ten days to seven months to allow participants flexibility in fishing their tier amounts. Finally, the program implemented several additional provisions, some of which were intended to limit control of the resource and to maintain the small, owner-operator character of the fleet.

The program has been operating for over a decade and has met the goals and objectives set for the program. The sablefish season is longer. There have been few permit transfers in recent years, indicating fleet stability. There has been a reduction in the number of vessels harvesting sablefish (i.e., there are 59 fewer vessels fishing sablefish). Finally, the program has provided more flexibility and has maintained the small, owner-operator character of the fleet.

U.S. Rights-based Management Experiences Panel Discussions

Panelists explored the three interest areas and provided insights based on their experiences with RBM programs.

Nature of Questions to the Panelists:

Program Planning and Design
Identifying needs and objectives, clarifying roles, sharing information, key considerations, and difficult issues

Program Evaluation and Performance
Measuring success, identifying areas for improvements, outcomes, and lessons learned

Regional Interests and Flexibility

Panelists: Linda Kozak, Rachel Baker, Mark Grant, and Elizabeth (Libby) Etrie

Program Planning and Design

- **Ensure that historical catch and fishery data are adequate and confidentiality is protected.**
  Panelists agreed that access, adequacy, timeliness, and the ability to evaluate and provide feedback reviews on baseline data are essential. As one panelist stated, "more information upfront and early is better." Since stakeholders place great value on initial allocations and historical data, it is a good practice to have data that are both accessible and accurate. Otherwise, this issue could end up overshadowing other important steps in program design.

- **Engage stakeholders early, comprehensively, and efficiently.**
  Each panelist reaffirmed the importance of stakeholder engagement from the earliest stage of program consideration through—and during—implementation. They underscored that the process must not be a rush to the finish. However, participants were quick to highlight that stakeholder participation needs to be efficient. Suggestions for improving stakeholder process efficiencies included work committees at the Council level; pooling resources to send a representative for several stakeholders; and program support that is responsive to stakeholders' time and schedules.

- **Expect challenges when establishing provisions for eligibility, initial allocations, and transferability.**
  Determining eligibility and selecting qualifying years to serve as the basis for allocations require careful consideration to ensure an equitable outcome. Related considerations are:
  - determining the basis of initial allocation, such as catch history participation, which years, and how far in the past (e.g., the halibut IFQ allocation was based on the best three of five past years of catch);
  - deciding on leasing options; and
  - setting ownership and vessel caps.

- **Ask questions regarding fishery goals and interests.**
  Discuss how much, if any, consolidation is desired in the fishery as a whole and whether it makes sense to formalize linkages with processors.

- **Allow enough time to consider program alternatives before implementation.**
  Critical to striking a balance between a simple and a complex program design is to allow time to assess and evaluate alternatives, gather and share data, and educate managers, industry, and enforcement on the ramifications of implementation. Two panelists recommended a year or more to orient industry to system changes before full program implementation.

- **Match program complexity with program objectives.**
  Panelists urged development of a relatively simple program that can accommodate adjustments as conditions change. Some expressed caution on both extremes. An overly simple program can lead to unintended consequences (e.g., too much consolidation). The more complex the program, the greater the administrative burden of managing it. For example, the Gulf of Alaska Rockfish Program, which includes cooperative, entry level, limited entry, and sideboard allocations has a complicated quota management system.

Community Considerations

Panelists: Rachel Baker, Linda Kozak, Ed Backus, and Kelly Denit

Program Planning and Design

- **Identify and clarify roles in the program development process.**
  Clearly defining the roles and responsibilities of NMFS, the Councils, and the community is essential to engage stakeholders effectively and knowledgeably. Up front identification and communication of these roles and responsibilities enhances interest, trust, and understanding of the process. As one panelist phrased it, "... there is a ping-pong game between the Regional Fishery Management Councils and NMFS" regarding who is providing guidance to stakeholders on community considerations with RBM approaches, "because NOAA does not want to produce guidance that would be too firm and the Councils are concerned about taking the initiative without more guidance." However, without clear guidance, there is often uncertainty as to who drives final decisions. Achieving some level of consensus on the interests and needs of fishing communities (i.e., geographic or interest-based) and conveying those to the Council—early in the process—is imperative if outcomes are to support such considerations.

- **Establish flexible, innovative forums to increase stakeholders' participation and knowledge.**
  RBM program planning entails a learning curve and can be a time burden for stakeholders. To address these concerns, panelists suggested organizers ensure the appropriate mix of stakeholders is engaged and the process is designed around realistic time commitments from participants. In the North Pacific Council, committees were formed to generate ideas, work through implementation issues, and prepare recommendations to the Council. These committees were seen as "a less daunting place to throw out ideas than on the Council floor." One panelist suggested like-minded fishing groups pool resources to stay engaged by jointly hiring a spokesperson. Creation of knowledge-sharing groups was another strategy offered. In Alaska, the Gulf of Alaska Coast Communities Commission was formed to create a capacity-building process with technical workshops to ramp up stakeholder knowledge and enhance participation and negotiation. One panelist discussed the Community Fisheries Network as a "peer-to-peer system to build capacity and knowledge" among fishermen.

- **Design resilient and flexible programs.**
  The key focus is to manage for the primary objectives specified by stakeholders and develop some provisions for these interests up front. Then consider multiple scenarios of future realities to create a plan that will be resilient and flexible. There was consensus that, in any program, the basic idea of regional allocations could be a starting point. Design the program so that management can adjust and provide longer-term opportunities without substantial disruptions to existing fishery operations.

Program Evaluation and Performance

- **Effective program evaluation and modifications depend on clearly defined and measurable objectives.**
  Measurable characteristics that are important to stakeholders—such as vessel size diversity, regional landing diversity, and fishery biomass—should be used later to evaluate the new RBM program and to evaluate program efficacy. By identifying clear objectives upfront, success can be defined, accomplishments assessed,

and changes made when necessary. A panelist assured the group that this work is difficult and that they should not expect to get it right the first time: "It's worse than rocket science. Rocket science at least follows the laws of physics."

- **Monitoring and evaluation are needed during implementation to ensure desired community benefits are met.** Planning for which communities will benefit and how is a challenge and is hard to predict. Objectives may not be met initially. Programs need to be evaluated mid-course to verify whether intended beneficiaries are indeed benefiting and modify accordingly. One panelist conveyed that difficult decisions sometimes create new opportunities for communities. At the same time, the program design should prevent disruption and inequity to the overall community.

- **Recognize that access to capital can be a barrier.** This is an ongoing concern recognized by stakeholders and NMFS. Agency staff have approached the USDA to learn about their grant and loan programs and how they have structured them. One panelist discussed how access to financing became a major barrier in Alaska: developers of the CQE program carefully considered their needs, but they planned to use the Alaska Native Claims Settlement Act and it turned out not to be a reliable source.

Economic Efficiencies and Benefits

Panelists: Jessica Stephen, Bill Tucker, Jamie Goen, Michele Longo Eder

Program Planning and Design

- **The need for market stability was a common driver for fisheries to transition to catch shares and to increase product continuity in a year-round market.** Panelists identified the need in each case to ease pressures of fishing season limits, which perpetuate a race for fish and constrain value in fisheries. Fishermen wanted to extend the season to a year-round fishery to achieve stable pricing. After catch shares were implemented, fish prices stabilized in these fisheries. A panelist elaborated on the Gulf of Mexico red snapper and tile/grouper fish fisheries—the waste from a flooded market and depressed prices—and how inefficient and time-consuming it was to attract and re-attract buyers when the product flow was inconsistent.

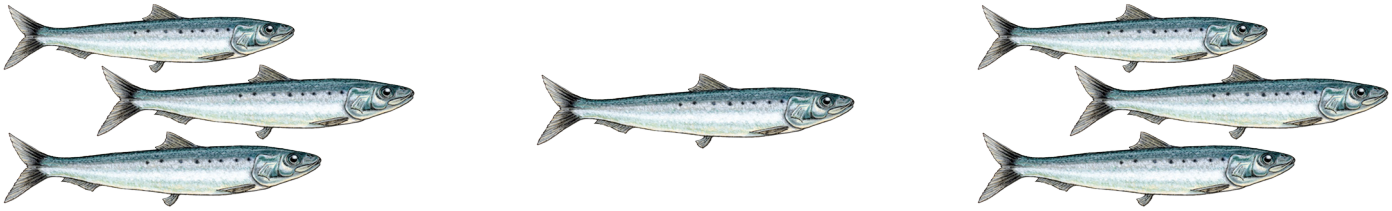
Program Performance and Evaluation

- **Increased opportunities for fisheries innovations in conservation and gear efficiencies.** Catch shares can allow more time and flexibility to be proactive in addressing conservation concerns, such as bycatch reduction and the protection of listed species or habitats. Fishermen may partner with research groups interested in experimental fishing or gear testing through quota leasing opportunities.

- **Fishermen now choose to fish when it is in their best interest.** Panelists all identified the benefit of flexibility: the ability to select which fisheries to target based on demand and stock quality/availability. Fishermen have been able to shift in and out of a fishery when beneficial or efficient. Supply can now be more tailored to demand.

- **New opportunities emerged to increase market benefits through product control and branding.** Panelists discussed new opportunities to add value to products and ensure traceability as they make their way to market and the consumer. With longer seasons, fishermen can work with the processor to develop more product options and sales channels (e.g., icing for later sale, brokering). Improvements in product control increased branding opportunities. For example, Gulf Wild, a seafood branding organization in the Gulf of Mexico, established a set of catch compliance standards and provides real-time data and the ability for consumers to trace products back to fishermen who fish sustainably and locally, which adds value to the fishery and increases the willingness of consumers to pay a higher price.

Workshop participants discuss rights-based management approaches.



PACIFIC SARDINE FISHERY PERSPECTIVES

Workshop participants discussed the needs and interests of the Pacific sardine fishery and considered whether components of the RBM programs presented throughout the workshop had relevance to this fishery. The goal of the discussions was to consider how the fishery could be improved in the long-term (i.e., 10 to 15 years out).

These discussions occurred in a plenary and a breakout group session. The latter consisted of three cross-interest groups of about 10 to 12 participants representing diverse geographic and industry interests. NMFS staff was evenly distributed across the groups. Managers and industry from other fisheries asked specific questions about the Pacific sardine fishery and provided input based on their experiences.

Defining Characteristics and Long-Term Interests of the Pacific Sardine Fishery

Plenary Discussion Themes

- **The fishery could be improved by addressing issues of allocation in low-abundance years.**
  Many harvesters and processors believe that the existing sardine fishery allocation mechanism can be improved, especially to improve flexibility in low-biomass years. A significant problem relates to the derby-like conditions resulting from reduced seasonal allocations. However, many participants in the sardine fishery feel that it is not a true derby fishery, even in low-biomass years, because they have been able to coordinate harvests to fill diverse market orders and manage product flows to avoid market gluts. They questioned what the fishery will gain with catch shares management. Most participants expressed that reaching industry-wide agreement on specific modifications to the allocation system (with different fishermen, processors, and buyers having different market needs) may be a challenge, especially if the allocation remains coast-wide.

- **The current seasonal allocations constrain choices about when to fish; fishermen are not able to fish at optimal times in their area.**
  The fishery management structure and timing of the seasonal allocations conflict with market demands of size and quality of fish, especially during low quota years. The three groups agreed that in each region fishermen are "not able to fish for the right fish at the right time." Though the fishery is conservatively managed and the stock is healthy (i.e., no overfishing, not overfished), the current allocation structure does not provide enough harvest flexibility to meet buyer demands. For example, October through December is the best time to fish in California, but shortened seasons prevent fishing during these months when sardines are typically larger, more abundant, and more valuable. Fishing schedules are important to consider, as fishing opportunities vary by region and the fat content of the fish changes throughout the year—an important factor in consumer and industry market demand. Furthermore, opportunity costs also result from needing to redirect effort away from a more lucrative catch (e.g., squid in California or whiting and salmon in the Pacific Northwest) in favor of securing sardine catch.

- **The structure of state and federal permits has inconsistencies and competing incentives.**
  Participants perceive inequities in the permit programs between state limited entry and federal limited entry permit requirements. Many feel that the incongruence between state and federal permits (in California, Oregon, and Washington) causes unnecessary confusion related to differences in harvesting capacity constraints.

- **The fishery could benefit from a management strategy that empowers stakeholders to better anticipate and plan for future pressures.**
  Industry is concerned that, going forward, external pressures could cause economic, market, and environmental uncertainty for the fishery. For example current pressure, by non-governmental environmental organizations for improved management of forage fish, is viewed by some as a discouraging warning. One group expressed the general sentiment that management tools and policies are needed that help industry better anticipate future environmental and economic pressures and be proactive in responding responsibly.

Perspectives on Rights-based Management

Discussion Questions:

- What RBM approaches or program elements presented seem relevant, if any, to the Pacific sardine fishery?
- What might an RBM approach in the sardine fishery look like?
- What could be the advantages and disadvantages of shifting to an RBM approach over the current management approach?

Group Discussion Themes

- **Stakeholder engagement would be essential.**
  It is important to engage a broad cross-section of stakeholders and involve them throughout any discussions on RBM. One group stated simply that "More is better when it comes to stakeholder engagement."

- **Simplicity in program design would be appealing.**
  One group emphasized that an RBM program could be cumbersome and expensive to administer. If one was created, however, most participants favored a simple program that would be relatively easy to participate in and understand. This would be particularly important to those who have never been a part of a catch share program. On the other hand, many participants expressed concern that a one-size-fits-all approach would fall short of improving conditions in the fishery.

- **Electronic data collection and monitoring is desirable.**
  Groups were interested in the electronic data collection systems used in some RBM fisheries and thought such systems could be helpful in managing the sardine fishery, particularly to track landings data for more effective quota monitoring.

- **A simple, flexible, equitable, and region-based RBM program is of interest to some.**
  A comprehensive RBM program may be feasible, but it is essential that each region be involved in its development, as each region differs in their operations and should have the ability to manage according to their environment and market conditions. Good data and science are a precursor to proper allocation planning. It is also important to be cautious about creating "winners and losers" in the fishery and to strive for equitable allocations. However, it should be recognized that RBM programs that enable fishermen to choose whether to compete to catch quota in a common pool or to participate in a rationalized fishery are resource-intensive because they require administration of two management programs. A quantity allocation, by region, would be more effective than seasonal allocations as is the case now. Several participants expressed the need to build in flexibility to any such program so there would be no need to return to the Council for changes in policy. One participant expressed the idea: "Start simple and move in a stepwise process."

- **Any program would need to carefully address the balance of market power between processors and harvesters.**
  Given the amount of de facto vertical integration in this fishery, ownership of the quota is an important and concerning issue. Processors are concerned with the potential to be left with stranded capital. Harvesters are concerned with product price rigidity.

- **Creating equitable initial allocations may be challenging.**
  All groups mentioned the need to alleviate industry concerns about initial allocation; that it could be done so as to uphold the spirit of competition and cohesion of the industry. As one group stated, "healthy competition must be maintained so that those who work the hardest are rewarded." There is a general concern

among many industry members that a catch share program allocation could result in far less quota than their potential (or best) catch under the current fishery management structure. Other key questions participants identified about allocation included:

- When should the system be developed and by whom?
- Will the limited entry permits be replaced by a new permit system?
- How will "last minute" participants and latent permit holders be accommodated?
- How can industry avoid a regional allocation battle?
- Can permits mobile to avoid excess effort in one area?

- **Some see the potential for RBM to enhance a fishery's value.**
  One group summarized the ideas and opportunities considered over the course of the workshop as follows: "Whenever you have a race to fish, you have issue of quality. ... We can, ideally, increase the [quality of the] end product and, thereby, add value to the fishery."

Photo: Sunset over water. Credit: © **Microsoft.**

WORKSHOP REFLECTIONS AND POTENTIAL NEXT STEPS

Throughout the breakout group discussions and report-outs, Pacific sardine fishery participants contributed the following insights and future interests:

- There is a shared interest among harvesters and processors to improve management, enhance flexibility in fishing operations, increase quality, and reduce uncertainty while maintaining the spirit of fair competition and opportunity. No consensus was reached as to whether RBM was the right approach.
- The three breakout groups each discussed that a "harmonized" permit system (i.e., one consistent permit) should be considered.
- Most agreed that a region-based allocation scheme would be an improvement. There was no agreement on the number of regions but all felt that the following characteristics pertaining to the harvest flexibility among regions warranted further discussion:
  - "use it or lose it" provisions;
  - the nature of transferability between regions based on fish availability; and
  - flexibility for regions to decide on a catch- share or non-catch share allocation and whether and how to transfer quota between these areas.

APPENDICES

Appendix A: Workshop Agenda

Coastal Pelagic Species Workshop II: Considerations for Rights-based Management in the Pacific Sardine Fishery

Day One

8:30 am **Opening Remarks**
Mark Helvey, Assistant Regional Administrator for Sustainable Fisheries, NMFS, Southwest Regional Office (SWRO)

Sam Herrick, Industry Economist, NMFS, Southwest Fisheries Science Center (SWFSC)

9:00 am **Agenda Overview**
Scott McCreary & Peter Bluhon, CONCUR, Inc.

The Pacific Sardine Fishery – Characteristics & Interests

9:05 am **Overview of the CPS & Sardine Fishery**
Josh Lindsay, NMFS, SWRO CPS Fishery Management Plan Lead

9:30 am **Review Key Points from CPS Workshop I**
Mark Helvey, NMFS, SWRO

9:55 am **Defining Characteristics & Long-Term Interests Discussion of the Sardine Fishery**
Full group discussion, facilitated by CONCUR, Inc.

Catch Shares and U.S. Industry Perspectives

11:20 am **U.S. Industry Experiences & Perspectives Panel**
Bill Tucker – Gulf of Mexico red snapper, Grouper/Tilefish Individual Fishing Quotas (IFQs)
Linda Kozak – Halibut/Sablefish IFQs, Crab Rationalization, BSAI Pacific Cod Freezer Longline Coops
Elizabeth Etrie – New England Sectors
Michele Longo Eder – Pacific Sablefish Permit Stacking & Groundfish Trawl Rationalization

1:50 pm **Overview of Catch Shares in the United States**
Kelly Denit, NMFS, National Catch Share Policy Coordinator

Experiences I: Designing for Regional Interests & Flexibility

2:15 pm **Introduction**
CONCUR, Inc.

2:20 pm **New England Multispecies Sector Program**
Mark Grant, NMFS, Northeast Regional Office (NERO)

2:40 pm **Gulf of Alaska Rockfish Program**
Rachel Baker, NMFS, Alaska Regional Office (AKRO)

3:25 pm **Panel Discussion – Regional Interests & Flexibility**
Mark Grant, NMFS, NERO
Elizabeth Etrie – New England Sectors
Rachel Baker, NMFS, AKRO
Linda Kozak – Halibut/Sablefish IFQs, Crab Rationalization, BSAI Pacific Cod Freezer Longline Coops

4:00-4:20 pm **Day 1 Wrap Up**
CONCUR, Inc.

Day Two

8:30 am **Welcome Back**
Mark Helvey, NMFS, SWRO

8:35 am **Review Progress and Overview Day 2**
CONCUR, Inc.

Experiences II: Designing for Community Considerations

8:45 am **Introduction**
CONCUR, Inc.

8:50 am **Western Alaska Community Development Quotas and Halibut Community Quota Entities**
Rachel Baker, NMFS, AKRO

9:15 am **Fishing Communities**
Ed Backus, Ecotrust

9:40 am **Panel Discussion – Community Considerations**
Rachel Baker, NMFS, AKRO

Linda Kozak – Halibut/Sablefish IFQs, Crab Rationalization, BSAI Pacific Cod Freezer Longline Coops

Ed Backus, Ecotrust

Kelly Denit, NMFS

Experiences III: Designing for Economic Efficiencies & Benefits

10:25 am **Introduction**
CONCUR, Inc.

10:30 am **Gulf of Mexico Red Snapper**
Jessica Stephen, NMFS, Southeast Regional Office (SERO)

10:55 am **Pacific Sablefish Permit Stacking**
Jamie Goen, NMFS, Northwest Regional Office (NWRO)

11:20 am **Panel Discussion – Economic Efficiencies & Benefits**
Jessica Stephen, NMFS, SERO
Bill Tucker – Gulf of Mexico Red Snapper, Grouper/Tilefish IFQs
Jamie Goen, NMFS, NWRO
Michele Longo Eder – Pacific Sablefish Permit Stacking & Groundfish Trawl Rationalization

Pacific Sardine Fishery – Sharing Perspectives

1:15 pm **Small Group Discussions**
Discuss whether RBM has potential to address some of the needs and interests in the sardine fishery that were identified on Day 1.

3:00 pm **Report Out**
Full Group, Facilitated by CONCUR, Inc.

3:30 pm **Outcomes, New Insights, Potential Next Steps Discussion**
Full Group, Facilitated by CONCUR, Inc.

4:15 pm **Closing Remarks**
Mark Helvey, NMFS, SWRO
Sam Herrick, NMFS, SWFSC

Appendix B: Participant List

	Participant	Affiliation
1	David Crabbe	Pacific Fishery Management Council (PFMC)
2	Rod Moore	West Coast Seafood Processors
3	Kerry Griffin	PFMC
4	Richard Carroll	Ocean Gold Seafoods
5	Michele Longo Eder	F/V Timmy Boy
6	Libby Etrie	Northeast Sector Service Network
7	Ted Guglielmo	F/V Trionfo
9	Nick Jurlin	F/V Eileen
10	Linda Kozak	Gulf of Alaska and BSAI Fisheries Consultant
11	Eugene Law	PFMC Coastal Pelagic Species Advisory Subpanel
12	Rick Mayer	Marcus Food Company
13	Sarah McTee	Environmental Defense Fund
14	Tommy Noto	F/V Lady J
15	Mike Okoniewski	Pacific Seafood, Alaska Operations, Sardine and Squid
16	Diane Pleschner-Steele	California Wetfish Producers Association
17	Anthony Russo	F/V King Phillip
18	Vince Torre	Tri-Marine Fish Company
19	Sal Tringali	Monterey Fish Company
20	Bill Tucker	Gulf of Mexico Shareholders Alliance
21	Cyreis Schmidt	Oregon Department of Fish and Wildlife
22	Chelsea Protasio	California Department of Fish and Game
23	Steve Joner	Makah Fisheries Management
24	Joe Schumacher	Quinault Indian Nation
25	Ed Backus	Ecotrust
26	Kelly Denit	NMFS- Headquarters
27	Guy Dubeck	NMFS - Headquarters
28	Judson Feder	NMFS – Southwest Region
29	Jamie Goen	NMFS – Northwest Region
30	Mark Grant	NMFS – Northeast Region
31	Mark Helvey	NMFS – Southwest Region
32	Sam Herrick	NMFS – Southwest Fisheries Science Center
33	Rachel Baker	NMFS – Alaska Region
34	Jennifer Isé	NMFS – Southwest Region
35	Josh Lindsay	NMFS – Southwest Region
36	Amber Rhodes	NMFS – Southwest Region
37	Jessica Stephan	NMFS – Southeast Region
38	Dale Sweetnam	NMFS – Southwest Fisheries Science Center
39	Scott McCreary	CONCUR, Inc.
40	Peter Bluhon	CONCUR, Inc.
41	John Crofts	NMFS-Southwest Fisheries Science Center

Appendix C: Industry Panelists Perspectives

Industry members from other U.S. fisheries employing rights based management (RBM) shared with workshop participants both the primary needs that led to their fishery adopting an RBM approach and their perspectives on RBM in practice. Panelists presented in-depth perspectives on their experiences with RBM and engaged with participants over the course of the two-day workshop. The brief statements below were provided to participants in an advance of the workshop to offer insight into the panelists experiences and some issues and considerations they would be bringing to the discussions.

Elizabeth "Libby" Etrie, Massachusetts

Fisheries: Northeast Groundfish Multispecies Sectors

When developing or considering new management strategies for a fishery, it is essential to identify why a new approach is needed and to articulate the goals and objectives that such action hopes to achieve. Afterwards, consideration of all management programs, including but not limited to those generally categorized as catch shares or rights-based management, should be considered and evaluated against the identified problem statement, goals, and objectives. Rights-based management may be an appropriate strategy but should not be viewed as the only viable management alternative to initially explore.

Linda Kozak, Alaska

Fisheries: Halibut/Sablefish IFQ, Crab Rationalization, BSAI Pacific Cod Freezer Longline Co-ops

Rights-based management can include a variety of options, from cooperatives and catch shares to simple limited entry permit systems. Program design is critical and options must carefully consider how the fishery is currently conducted and what it could look like in 15 to 20 years, because changes after implementation are difficult. The most important stakeholders to include are current participants—both harvesters and vessel owners—since they have the most money on the line. 100 percent participation and support is unrealistic but concerns expressed need to be analyzed to design programs effectively. Initially, I was opposed to rights-based management. If designed correctly, however, rights-based management programs can result in more financially stable fishermen who can plan better for annual operations. Rights-based management can greatly improve product marketing efforts and result in better pay and more stable crew jobs, a healthier resource, greater safety at sea, and community benefits.

Michele Longo Eder, Oregon

Fisheries: Pacific Sablefish Permit Stacking and Pacific Groundfish Trawl Rationalization

Catch share programs can work, but their success in design and implementation must come from a "bottom-up" approach. If fishermen in a certain region and in a certain fishery see an ecological and economic benefit to a program it is more likely to succeed than a program initiated by management alone. Some of the most difficult issues that need to be hammered out by fishermen are initial allocation, limits on accumulation, and transferability.

Bill Tucker, Florida

Fisheries: Gulf of Mexico Red Snapper and Grouper/Tilefish IFQs

While originally skeptical of rights based management, after a thorough analysis of the management alternatives available in my fishery, I began to see the advantages of designing an individual fishing quota specific to our needs. The results have been positive, and the individual fishing quotas have achieved our stated objectives.

U.S. Department of Commerce
National Oceanic Atmospheric Administration
National Marine Fisheries Service
Southwest Region

For report information and copies please contact:

Sustainable Fisheries Division
Southwest Regional Office
National Marine Fisheries Service
501 West Ocean Blvd., Suite 4200
Long Beach, CA 90802

(562) 980-4030

This report and more information on the workshop are available online at:
NMFS SWRO Sustainable Fisheries Division Website
or at:
http://swr.nmfs.noaa.gov/sardine_wkshp/

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